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vised." The revision comprises, as expressed by the author in its preface, "notes on three more types of animal life and is bound in a still more convenient form." Notwithstanding the closing statement of the author as to mode of binding, that of the former edition is continued without modification. On this point the reviewer had occasion to designate it as "the rather crude, *shoe-string* method." A more clumsy or inconvenient form of binding for such a manual could hardly be devised, and it is a pity the author's purpose of improvement might not have been realized.

Certain errors pointed out in the former review remain uncorrected in the present edition.

C. W. H.

Ergebnisse und Fortschritte der Zoologie—herausgegeben von Dr. J. W. SPENGLER, Professor der Zoologie in Giessen. Bd. I., Heft 1, 1907; Heft 2, 1908. Jena, Gustav Fischer.

The undertaking of Professor Spengel and a corps of collaborators to present the results and progress of zoological investigation in a series of annual volumes will meet the hearty approval of zoologists everywhere. The general plan is to issue a series of parts as they are ready, so as to make up a volume each year of between 600 and 700 pages. The parts before us at the present time contain the following contributions: (1) "Die Chromosomen als angenommene Vererbungsträger," by Dr. Valentin Häcker, 136 pages; (2) "Die verschiedenen Formen der Insectenmetamorphose, und ihre Bedeutung im Vergleich zur Metamorphose anderer Arthropoden," by Dr. Richard Heymons, 53 pages; (3) "Die Scyphomedusen," by Professor Otto Maas, 50 pages; (4) "Die Amphineuren," by Dr. H. F. Nierstrasz, 68 pages; (5) "Die gegenwärtige Stand der Kenntnisse von den Copulationsorganen der Wirbeltiere, insbesondere der Amnioten," by Dr. Ulric Gerhard, 96 pages.

If the parts are a good promise of those to follow, it is obvious that the proposed series will have an exceedingly wide scope, so that the specialist in any particular field will not find his subject represented very often. But the object is rather to enable the student to

obtain authoritative information of the state of investigation in lines other than his own, and this object will certainly be admirably accomplished by such reviews with their full lists of references. The writer would raise the question whether it would not be better to classify the separate contributions so as to give each volume an individual character? The *pros* and *cons* on this question are perhaps sufficiently obvious, and it is also obvious from the list of contributions to the first two parts that the editor will not take the responsibility of giving invidious precedence to any subject.

The publication has a field of its own which is not covered by the *Zoologische Anzeiger*, *Zoologisches Centralblatt*, the *Concilium Bibliographicum*, the *Jahresberichte*, or by Merkel und Bonnet's *Ergebnisse der Anatomie und Entwicklungsgeschichte*. The separate contributions to the first two parts are admirably concise, sufficiently complete and critically excellent. One must admire the enterprise of our German colleagues, who find time in the midst of unremitting investigation to sum up and present to the world these necessary records of progress, which contribute to the progress itself by the mere process of organization. So long as German scientists are willing to perform such necessary functions in so admirable a way, we of a newer country and culture are relieved of such duties and should be properly grateful. American science is no longer an undiscovered bourne in Germany; on the whole, the contributions of American zoologists to the subjects treated receive adequate recognition.

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SIR WILLIAM RAMSAY ON TRANSFORMATION OF THE ELEMENTS

IN the course of his presidential address before the Chemical Society, London, on March 25, Sir William Ramsay said, as reported in the *London Times*, that his subject was the hypothesis that the genuine difference between elements was due to their gain or loss of electrons. The question was whether, to take a concrete example, an atom of sodium by

losing or gaining electrons remained an atom of sodium, or whether the loss or gain of electrons did not cause it to change into some other element or elements. Having stated some theoretical arguments in favor of the possibility of transformation, he went on to describe some experiments bearing on the question. He first mentioned the transformation of radium emanation into helium, which had been amply established. He next referred to his experiments on the action of emanation on solution of copper sulphate and nitrate. Four experiments were made, and with each exactly similar duplicate experiments were tried in which no emanation was employed. A larger residue was obtained in each case from the emanation solutions than from the duplicates, and while the residues from the emanation solutions showed a faint trace of lithium, those from the duplicates failed to give spectroscopic evidence of the presence of that element. The fact of the experiments having been carried out in duplicate rendered inapplicable the criticism of Professor Hartley that accidental contamination with lithium was probable. As regards the alleged repetition of the experiments by Mme. Curie and Mlle. Gleditsch, who, using platinum vessels, obtained no greater residue and no trace of lithium, there were two possible replies—either the conditions were varied, or conceivably a trace of lithium from the glass vessel employed (which, however, had been tested for lithium with negative result) was dissolved in presence of emanation and copper but escaped solution in absence of copper or of emanation. A research on the action of emanation on solution of silver nitrate contained in a silica bulb yielded negative results, but he had stumbled across a case of apparent transformation while working in a totally different direction. On December 20, 1905, 270 grams of purified thorium nitrate were dissolved in about 300 c.c. of water, and the flask in which the solution was contained was repeatedly evacuated by a mercury pump until no gas could be pumped off. The stopcock attached to it was then closed, arrangements being made so that if any leakage occurred it would be detected. After the flask had stood for 168 days the gas

in it (5.750 c.c.) was pumped out and examined for helium with doubtful results. The flask was again closed, and on August 3, 1907, after 173 days, the gas in it was again examined. Again the presence of helium was questionable, but 1.08 c.c. of carbon dioxide was found. At the next examination, on March 30, 1908, there was distinct evidence of a helium spectrum, and the gas contained 1.209 c.c. of carbon dioxide. It was then thought possible that the carbon dioxide had been produced from the grease of the stopcock, and therefore a little mercury was introduced into the capillary tube leading to the stopcock so that the latter was protected from contact with the thorium solution. After 310 days the gas was again withdrawn. Instead of 3 c.c. or 4 c.c. no less than 180 c.c. were collected; it was almost pure nitrogen, but in all 0.622 c.c. of carbon dioxide was separated from it. These experiments, Sir William Ramsay said, rendered it at least probable that thorium engendered carbon dioxide, or, in other words, that carbon was one of its degradation products. Experiments further indicated that the action of radium emanation on thorium nitrate solutions was also attended with the formation of carbon dioxide, and the same was the case with an acid solution of zirconium nitrate. An experiment with lead chlorate proved blank, but with bismuth perchlorate the formation of carbon dioxide appeared certain. In conclusion Sir William Ramsay, after mentioning that every precaution which could be thought of was taken to exclude foreign gas, said that while these were the facts no one was better aware than he how insufficient was the proof, and that many other experiments must be made before it could be confidently asserted that certain elements, when exposed to "concentrated energy," underwent degradation into carbon.

POISONOUS EMANATIONS FROM FERRO-SILICON

LAST December five Russian immigrants, the only steerage passengers on the steamer *Ashton* from Antwerp to Grimsby, were found dead on the arrival of the vessel at the latter port. Owing to bad weather the steerage ac-